Effect of Mineral and Bio-Fertilizers and Ascorbic Acid on Growth, Chemical Composition, Essential Oil, Antioxidant and Antimicrobial Activity of *Tagetes minuta* L. Plants

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THIS STUDY was carried out at the experimental area of the Ornamental Horticulture Department, Faculty of Agriculture, Fayoum University, during the two successive seasons (2008 and 2009). The obtained results indicated that, generally, treated Mexican marigold plants with phosphorein or biogein combined with NPK at the low rate (2gm/plant) and sprayed with ascorbic acid at all investigated concentrations gave the best results of vegetative growth characters [plant height (cm), number of branches on the main shoot / plant and fresh weight of herb and root/ plant (gm)]. Plants treated with biogein combined with NPK at 2 gm/ plant and sprayed with ascorbic acid at 200 ppm gave the highest percentages of total nitrogen while plants treated with phosphorein combined with NPK at 2 gm/ plant and sprayed with ascorbic acid at 200 ppm gave the highest percentages of phosphorus in leaves. Concerning to oil percentage, treated *Tagetes minuta* L. plants with phosphorein combined with NPK at 2 or 4 gm/plant and sprayed with ascorbic acid at any rate increased oil percentage compared with the other treatments. Analysis of the essential oil of *Tagetes minuta* L. growing in Egypt by gas chromatography mass spectroscopy (GC/MS) technique confirmed that Limonene, Ocimene, Terpinolen, Oxirane, 2.methylbutyl, 2.cyclohexen.1.one, 3.Methyl.6.(1.methylethyl), 3.Octyne, 6.methyl, 5.Octyn.4-one, 2,7.Dimethyl, and 2.pinen.4.one being the main components of the oil. Essential oil of *Tagetes minuta*, showed several degrees of antimicrobial activity against Gram positive and Gram negative microorganisms. Our results indicated also that *Tagetes minuta* has high content of total phenolic compounds and exhibited a high radical scavenging activity.

Keywords: *Tagetes minuta, Asteraceae, Biogein, Phosphorein, Essential oils, GC-MS, Antioxidant and antimicrobial activities.*